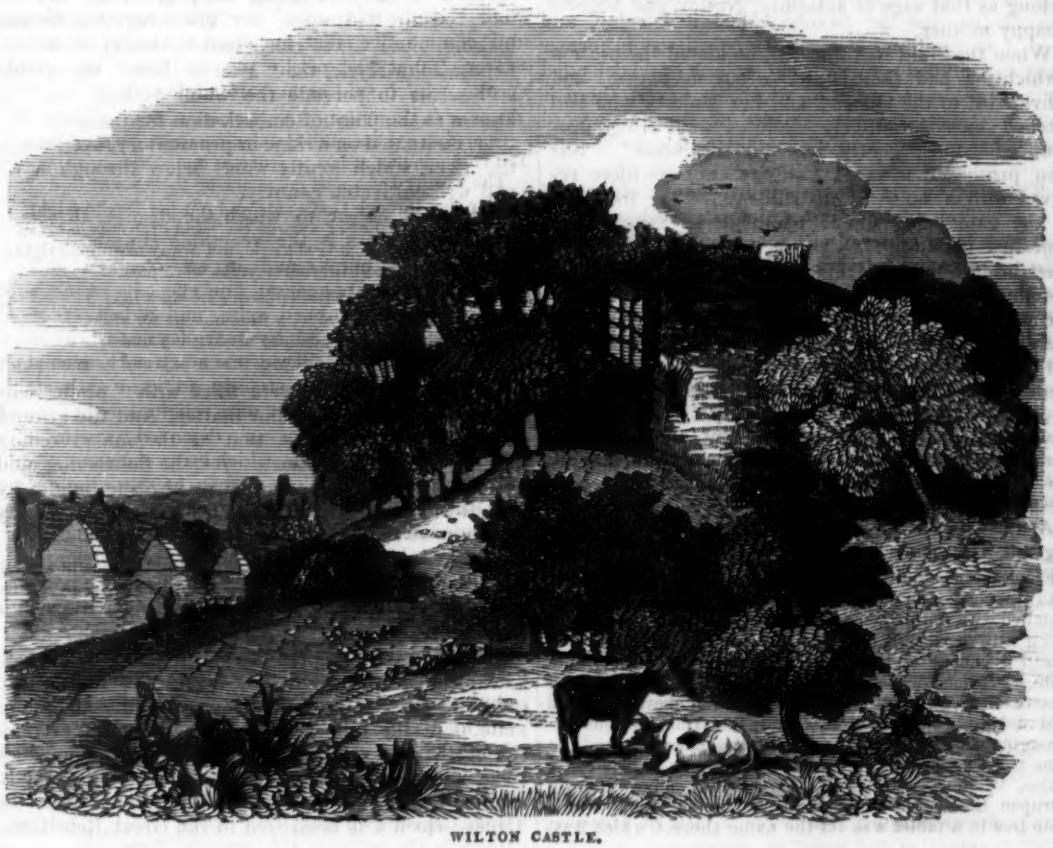
THE

Saturday Magazine.

No. 392. AUGUST 11TH, 1838. {PRICE ONE PENNY.

THE WYE AND MONMOUTHSHIRE. No. III.



WILTON CASTLE.

BRADWARDINE—KENCHESTER—HEREFORD—MARCLAY HILL—SELLACK—ROSS—MAN OF ROSS—WILTON CASTLE.

> Morn crimsons o'er the hills, while far below,
> Half lost in woods, half gleaming to the pale
> Of twilight, Vaga's wizard waters flow
> Reluctantly through yon Elysian dale—
> Soft image of some happier world.

In journeying onwards to Hereford, many pretty villages greet the eye of the traveller as he follows the course of the river. The country which, after leaving the Hay, is fertile and well cultivated, on approaching *Bradwardine* assumes a bolder aspect, and among the various eminences, *Mirebich Hill* rises prominently in the fore-ground. The Wye, at Bradwardine, is luxuriantly adorned with wood. A castle which formerly stood here is said to have been the residence of the family of Bradwardine; Thomas, one of whom, was archbishop of Canterbury in the time of Edward the Third, but this is considered doubtful. *Brobury's Scar*, a bold and majestic cliff rising on the north bank of the river, affords a splendid contrast with the adjacent scenery upon its banks. *Moccas Court* is delightfully situate upon elevated ground on the southern bank, and many other beautiful villas embellish the landscape in the vale of the Wye before the traveller reaches Hereford. Golden Vale, or *Driffin Dwr*, through which runs the Dour, a tributary of the Monnow, which joins that river near Grosmont, in Monmouthshire, is a scene of "fairy land;" and as it lies in the immediate neighbourhood, a visit to it should by no means be omitted. The part of the country eastward of the vale towards Hereford, is called Archenfield.

Kenchester, situated on a small river called the Ine, which runs into the Wye at Hereford, is the supposed site of the ancient city Ariconium, where King Offa had a palace. In Leland's time the place was overgrown with brambles and brush-wood. Many large foundations and various remains of Roman masonry brought to light from time to time, attest its ancient splendour and magnificence. In 1679 a Roman brick vault was discovered, and the following year Sir John Hoskyns found a bath about seven feet square, with leaden pipes entire. A Roman encampment called *Magna Castra*, is in the immediate vicinity. The destruction of Ariconium, which is absurdly attributed to an earthquake, has been well described by Philips, in his poem called *Cider*.

About a mile from Hereford, stands the hexagon shaft of a stone cross, about fifteen feet in height, called White Cross. It is supposed to have been erected by Lewis Charlton, bishop of Hereford, in the year 1345, in commemoration of an infectious distemper then raging in the city, which caused the inhabitants to hold their markets here.

The city of HEREFORD is pleasantly situated on the left bank of the Wye, nearly in the centre of the county. The name is said to signify the ford of an army. The Welsh call it *Hen-fordd*, or the old way; and Trefawith, signifying the beech-trees. Camden informs us that the Saxons called it Fernlay, and held it as a military station. Hereford was in former days surrounded with walls and a ditch; and defended by a magnificent castle, of which, however, there is now no trace: the earth-works of the outer ward have been converted into pleasant walks for the use of the inhabitants.

There is an air of tranquillity—an "old world character" about Hereford, which is refreshing to the wayfarer from crowded cities, and attributable to the absence of manufactures and the sombre aspect of its ancient buildings. Cider, grain, oak-timber, &c., are occasionally conveyed down the river in barges to Bristol and elsewhere, when the water is sufficiently deep to allow vessels to pass over the shallows; and by the same mode of conveyance coals are brought up from the Forest of Dean and Chepstow. Some of the streets are wide, but the houses in general are not remarkable in an architectural point of view. Of the "six noble gates" mentioned by Leland, there is not a trace remaining. The principal ornament of the city is its aged cathedral, with which the readers of the *Saturday Magazine* are already acquainted*. There were formerly five churches besides the cathedral, two of which were destroyed during the civil war in 1645, by the Scotch forces during a siege. The old Roman Catholic chapel in the Broad Street has lately been pulled down, for the purpose of erecting on its site "a large and handsome Catholic church."

Two hills in the neighbourhood, Dinedor and Acornbury, are worth visiting; especially the latter, which, in addition to the remains of a fine Roman camp on its summit, embraces a view of Hereford, and an extensive and beautiful prospect.

The Wye at Hereford, Mr. Roscoe playfully observes, "looks placid and smooth,—the beautiful romping hoiden of Plynlimmon, tamed down into a quiet *douce damosel*." In its course onwards to Ross, it meanders through a rich undulating country, pronounced "tame" by Gilpin, but affording one of the most beautiful examples we are acquainted with of thoroughly English scenery; orchards and hop-grounds, smiling villages and hallowed fanes, (Herefordshire is renowned for its spires,) green knolls and wooded hollows.

Near the junction of the Lug (in which there is excellent trout and grayling fishing) with the Wye, six miles below Hereford, is Marclay Hill, which, "in the year 1557," Camden says, "did for three days together shove its prodigious body forward, with a horrible roaring noise, and overturning everything in its way, raised itself to the great astonishment of the beholders to a higher place." It is also stated by another old writer, who probably alludes to the same event, that in the year 1575, "many acres of Marclay Hill gave way and separated from the rest, leaving a gap four hundred feet long, and three hundred and twenty feet wide, overthrowing Kinaston chapel and several other houses in its fall." On a well-wooded hill, called Woldbury, from whence is an extensive prospect, are the highly interesting traces of an ancient camp, double trenched and nearly half a mile long. Sellach church is of singular construction, and the east window is beautifully ornamented with stained glass, bearing the date of 1630. A fine old *British highway* runs down from the church to a ford on the river. About a mile below Ingeston, on Eaton Hill, is another of those ancient hill-fortifications, which form a regular chain in this part of the country; the intrenchments are very deep and perfect. At *Abnot* there is a very beautiful view of Ross, with its "heaven-directed spire." This neat comfortable-looking, little town, celebrated for the good deeds of honest John Kyrle, the "Man of Ross," whose spirit still seems to pervade the whole locality, and well known as the point of embarkation for the lower Wye tour, is situated on a ridge or promontory, overhanging the river, which gently winds below through a rich and well-cultivated country.

The first object to which the stranger directs his attention at Ross is the venerable church, which is admirably situated, and in an excellent state of preservation. Its general, fine effect is owing to its lofty, well-proportioned spire, and a belt of stately elms, planted in 1685 by John Kyrle, whose useful and honourable life we have already recorded*. The east window is tastefully adorned with stained glass, which reflects "a dim religious light" on the surrounding mementos of departed worth. The great bell of the church, which bears the name of John Kyrle, was cast at Gloucester in 1695, at the expense of that excellent individual. It is said that he attended there himself on the occasion, and taking with him his old silver tankard, after drinking the sterling old toast of "Church and King," he threw it in, and had it cast with the bell. In the east window of the north aisle, in the interior of the church, two slender young elms spring from the roots of one of the original trees planted by Kyrle. There is a legend about these trees, which, whether true or not, is so singular and touching that we cannot pass it over. It is said that after the death of their planter, a rector cut down some of the trees facing the pew of honest John Kyrle, and that immediately afterwards several shoots sprang up from their roots, which, penetrating through the walls of the church, formed a graceful and verdant drapery over the seat of the beneficent old man. These trees, which we trust will be suffered to flourish unmolested, are regarded by the inhabitants with feelings of almost superstitious reverence. The pew where Mr. Kyrle sat for so many years remains precisely as it was at the time of his decease, although the church has undergone various alterations and repairs since that period. There is a fine and extensive bird's-eye view from the "Prospect," or the "Man of Ross's Walk," adjoining the churchyard. Gray and Gilpin, however, speak disparagingly of it. The former says, "I find all points that are much elevated spoil the beauty of the valley, and make its parts, which are not large, look poor and diminutive." Ross is a rural deanery; the rectory and vicarage were consolidated by an act of the legislature in the reign of Charles the Second.

The unfortunate Charles the First slept at Ross in 1645, on his way from the princely castle of Ragland, at that time garrisoned by the followers of that devoted and loyal servant of the martyred monarch, the Marquis of Worcester. A house in Church-lane, called "Gabriel Hill's Great Inn," contains the old chamber where the king slept; now, however, it is divided into two. A small piece of the oak bedstead

* See Vol. V., p. 74.

* See *Saturday Magazine*, Vol. I., p. 164.

on which the king is reported to have lain, is preserved at the Blue Coat School House. There is little else to interest the antiquary in Ross.

The most easy, and perhaps the most pleasant mode of prosecuting the Wye tour from Ross, is to descend the river in one of the numerous and comfortably-fitted boats kept there for the purpose. The tourist, however, can thus only obtain a general idea of the scenery, without that acquaintance with its details, which so greatly enhances the interest of an excursion of this sort. For ladies, of course, this is the only plan to pursue; but to such as are able to "rough it," a pedestrian tour is decidedly preferable, as there are many interesting objects worthy of a visit on either side of the river, as well as in the neighbourhood, which can only be seen by this method;—there is yet a still better plan, and that is to *ponyize*, for as Sir Richard Colt Hoare very justly observes,—

A man on a pony has a far better chance of minutely noticing an object than a wearied pedestrian, whose thoughts, nature in exhaustion, must unavoidably direct to his dinner and his bed.

The first part of the river after leaving the town, is once more spoken of by Gilpin as "tame," but, he adds, "some relief is afforded by the Man of Ross's walk, a plantation of forest trees on the brow of a rocky eminence, and the back view of Penyard and the Chase Woods at the Weir-end." After crossing Wilton Bridge, a somewhat curious and antique structure, the small village of Wilton presents itself, and on the right bank of the river above the bridge, stand the ivy-mantled and crumbling relics of Wilton Castle, which was burnt to the bare walls by the Royalists during the civil commotions in the reign of Charles the First, in the absence of its then possessor Sir J. Brydges. It afterwards came into the hands of that excellent individual Thomas Guy, who founded the hospital which bears his name in London*, and bequeathed the Wilton estate to that charitable institution.

The Wye scenery, after leaving Wilton, gradually improves;—the lofty banks on either side are richly covered with wood, and the stream winding abruptly round several grand woody promontories, displays to the lover of nature fresh scenes of quiet beauty. Gilpin observes, at this spot, "The channel of no river can be more decisively marked than that of the Wye.—*Who hath divided a water-course for the flowing of rivers?* saith the Almighty, in that grand apostrophe to Job on the works of the creation. A nobler *water-course* was never *divided* for any river than this of the Wye."

* See *Saturday Magazine*, Vol. V., p. 42.

During the Rebellion in 1745, Alexander Macdonald, of Kingsburgh, was so involved in the escape of Prince Charles that his destruction seemed certain, and he was brought prisoner to Fort Augustus. During his confinement in the fort, an order came for the release of several prisoners. Amongst those who were to be released, the officer called the name of Alexander Macdonald, and asked Kingsburgh if that was not his name. "That is my name," said he; "but I suspect there is some mistake." "What do you mean," said the officer; "is not that your name?" "Yes, certainly," said Kingsburgh, but still warned the man there must be some error: at last he went out. He met a friend, who advised him to leave the place instantly. "No," said Kingsburgh, "I must stay and see if the officer does not get into a scrape; I shall go to that public-house opposite." In about two hours a body of soldiers came, with an order to arrest the officer on guard, for having let so dangerous a prisoner at large. Kingsburgh instantly ran across the street, saying to the officer, "I told you there was some mistake." The President Forbes, however, saved this noble-minded man's life.

CORONATION ANECDOTES. No. V.

Henry IV.

Henry IV. was crowned by Archbishop Fitzalan on the 13th of October, 1399, and on this occasion the Ampulla, whose legend we have before mentioned, was first employed. The king's second son Thomas, as lord high steward, presided in the Court of Claims, and it is chiefly from the record of his decisions that subsequent controversies respecting claims of service have been decided. After Henry had gone to the Tower, he created forty-six knights of the Bath, among whom were three of his own sons. The procession from the Tower to Westminster was unusually splendid, no less than six thousand horses having been employed on the occasion. Some difficulty appears to have arisen from Henry's defective title, and by the advice of his friends he added to his claim that he had been adopted heir by King Richard. This falsehood was introduced to set aside the superior titles of Edmund Mortimer, earl of March, and Richard, earl of Cambridge, in right of whom the house of York subsequently claimed the crown, and this gave rise to the wars of the Roses.

Jane, queen of Henry IV., was crowned in the year 1403, but the ceremony was not remarkable for its brilliancy or splendour.

Henry V.

Henry V. was crowned on the 9th of April, 1413. Holinshed informs us, "Such great hope, and good expectation, was had of this man's fortunate successe to follow, that within three daies after his father's deceasse, diverse noblemen and honorable personages did to him homage, and swore to him due obedience, which had not beene seene doone to anie of his predecessors, kings of this realme, till they had beene possessed of the crowne. He was crowned the ninth of April, being Passion Sundaie, which was a sore ruggie and tempestuous day, with wind, snow, and sleet, that men greatlie marvelled thereat, making diverse interpretation what the same might signifie." Hardyng mentions this tempest in his rhyming chronicle:

> On Passyon Sundaye after was this kyng,
> Anoynted and crowned without taryeng,
> The ninth daye it was of Apryll so
> With stormes fell and haylstones grete also.

Katherine of France, the queen of Henry V., was crowned on the 24th of February, 1420; the account which Holinshed gives of the magnificence displayed upon this occasion, is far too characteristic of the age to be omitted. "It is worth the noting, to consider and take a view of the goodlie order and reverend dutifulnesse exhibited on all sides to the new queene. .... After the great solemnization of the foresaid coronation in the church of St. Peter, at Westminster, was ended, the queene was conveied into the great Hall of Westminster, and there set to dinner. Upon whose right hand sat, at the end of the table, the archbishop of Canterbury, and Henrie, surnamed the Rich, cardinall of Winchester. Upon the left hand of the queene sat the king of Scots in his estate, who was served with covered messe, as were the foresaid bishops, but yet after them. Upon the same hand and side, near the boord's end, sat the duchesse of Yorke and the countesse of Huntington. The earle of March, holding a scepter in his hand, kneeled upon the right side; the earle marshall, in like manner, upon the left of the queene. The duke of Glocester, Sir Humfre,

was that daie overseer, and stood before the queene bareheaded. Sir Richard Nevill was that daie carver to the queene, the earle's brother of Suffolk cupbearer, Sir John Stewart sewar, the Lord Clifford pantler, in the earle of Warwicke's steed, the Lord Willoughbie buttler, in steed of the earle of Arundell, the Lord Graie Ruthin, or Ruffin, naperer, the Lord Audleie almoner, in steed of the erle of Cambridge. The earle of Worcester was that daie earle marshall, in the earle marshall's absence, who rode about the Hall upon a great courser, with a multitude of tipped staves about him, to make and keepe roome in the said Hall. Of the which Hall, the barons of the Cinque Ports began the table upon the right hand, towards St. Stephen's chappell, and beneath them, at the table, sat the vowchers of chancerie. Upon the left hand, next to the cupboord, sat the maior and his brethren, the aldermen of London. The bishops began the table, against the barons of the Cinque Ports; and the ladies against the maior. Of which two tables, for the bishops began the bishops of London and Durham, and for the ladies the countesse of Stafford and the countesse of North.

"The feast was all of fish, for the ordering of the service whereof were diverse lords appointed head officers, as steward, controller, surveior, and other honourable officers. For the which were appointed the earles of Northumberland and Westmoreland, the lord Fitzhugh, the lord Furnevall, the lord Graie of Wilton, the lord Ferres of Grobie, the lord Poinings, the lord Darcie, the lord Dacres, and the lord De la Warre. These, with others, ordered the service as followeth: and, for the first course, brawne in mustard, eeles in burneur, pike in herbage, fuiment with balien, lamprie powdered, trout, codling, plaice fried, martine fried, crabs, leech lumbard flourished tartes, and a devise called a pellican, sitting on hir nest with hir birds, and an image of St. Katharine (the patron saint of the queen) holding a booke, and disputing with doctors, holding this poesie in her right hand, writen in faire and legible letters, *Madame la Reine* (my lady the queen,) and the pelican answering,

C'est la signe et du roy,	'Tis the sign of the king,
Parer tenir joy,	That great joy he will bring,
Et a tout sa gent,	To all in his land,
Elle mette sa content.	By this fair lady's hand.

"The second course was, gellie coloured with columbine flowers, white potage or creame of almonds, breame of the sea, conger, cheuen, barbill and roch, fresh salmon, halibut, gurnard, rochet broiled, smelts fried, crevis or lobster, leech-damaske, with the king's poesie flourished thereon, *Une sans plus* (one without more), lamprie fresh baked, flampeine flourished with a scutchion roiall, and therein three crowns of gold, with flour de luces and floure of camomill wrought of confections, with a devise of a panther, and an image of St. Katherine, with a wheele in one hand, and a scrowl with a poesie in the other; to wit,

La royne ma fille,	This princess, my daughter,
In cesta ile,	In this isle girt with water,
Per bon resoun,	By her virtue will claim
Aves renoun.	Great honour and fame.

"The third course was, dates in compost, creame motle, carpe deore, turbut, tench, pearch with goion, fresh sturgion with welks, porperous rosted, crevesse de eau doure, pranis, eeles rosted with lamprie, a leech, called the white leech, flourished with hawthorn leaves and red hawes; a marchpane garnished with diverse figures of angels, among which was set an image of St. Barnabas, holding this poesie:

Il est cerit,	It is Heaven's decree,
Pur voir et eit,	As all present may see,
Per mariage pure	That this marriage of peace
C'est guere ne dure.	Will make the wars cease.

"And, lastly, a devise of a tiger looking in a mirror, and a man sitting on horse-backe, holding in his arms a tiger's whelpe, with this poesie:

Per force, sans resoun, ie ay prise ceste best.
By force, without noise, I have taken this beast;

and with his own hand making a countenance of throwing of mirrors at the great tiger, with this poesie:

Gile che mirrour	The force of this mirror
Ma feste destour.	Subdues beast. of terror.

"Thus with all honour was finished the solemn coronation, after which the queene sojourned in the palace of Westminster till Palme Sundaie following; and on the morrow she tooke her journie towards Windsor, where the king and she held their Easter."

HENRY VI.

Henry VI. was crowned at Westminster, Nov. 6th, 1429, being then only in the ninth year of his age. The coronation feast was celebrated at Westminster with great splendour; but we shall only notice a few of the dishes and devices. In the first course, Fabian tells us there were, among other royal viands, "Bore hedes in castellys of gold and enarmed," "Custard royall, with a lyopard of golde syttyng therein, and holding a floure de lyce." The pageant for this course was, "A sotyltie of Seynt Edwarde and Seynt Lowys armed, and upon eyther his cote armoure, holdyng atwene them a figure lyke unto Kynge Henry, standynge also in his cote armoure, and a scripture passynge from them both, sayinge,—'Beholde II perfyght kynges under one cote armoure,' and under the fete of the said seyntes was wryten this balade:

Holy seyntes, Edward and Seynt Lowyce,
Concerve this braunche born of your precious bloode,
Lyne among Cristen, most soveraygne of price:
Inherytour of the flour de lyce so gode:
This sixt Henry to reygne and to be wyse,
God graunte he may, to be your mode,
And that he may resemble your knyghthode and vertue.
Praye ye hertely unto our Lord Jhesu."

The most remarkable dishes in the second course were, "Gely, party wryten and notyd with *Te Deum Laudamus*, a whyte leche plantyd with a rede antelop, a crowne about his necke with a chayne of golde." The device, or "sotyltie," was, "An emperoure and a kynge, arayed in mantellys of garters, which figured Sygysmounde the emperoure, and Henry V., and a fygure lyke unto Kynge Henry the VI. knelynge to fore theym, with this balade takkyd by hym:

Agayn, myscreauntes, the emperour Sygysmunde
Hath shewyd his myght, which is imperyall.
And Henry the V. a nobile knyghte was founde
For Cristes cause in actes marcyall,
Cheryshed the churche, to Lollers gave a fall,
Gyvynge example to kynges that succede,
And to theyr braunche here in especiall,
While he doth reygne to love good and drede."

In the third course we need only notice one dish, "A bake mete, lyke shylde, quarteryd red and whyte, sette with losynges gilt and floures of borage." This course also had a "sotyltie," *viz.*, "Our Ladye syttynge with her childe in her lappe, and she holdyng a crowne in her hande. Seynt George and Seynt Denys knelynge on eyther syde, presentyd to her Kyng Henryes fygure, berynge in hand this balade, as followeth:

O blessyd Lady, Cristes moder dere,
And thou, Seynt George, that called art her knyght,
Holy Seynt Denys, O master most entere,
The sixt Henry, here present in your sight,

Shedyth of your grace, on hym your heavenly lyght.
His tender youth with vertue doth anaunce,
Borne by descent, and by tytle of ryght,
Justly to reygne in England and in Fraunce.

"And thus," says Fabian, "this solempne coronacyon with all honoure and joy fynyshed."

On the 17th of December, 1431, Henry VI. was crowned at Paris, with the ceremonies usual at the coronation of French kings; he had the crown and sceptre of England borne before him, and wore those of France in the procession.

Margaret of Anjou, queen of Henry VI., was crowned on the 20th of May, 1445, at Westminster. She was received previously into London with great splendour. "The city," says Stowe, "was then beautified with pageants of divers histories, and other showes of welcome, marvellous, costly, and sumptuous."

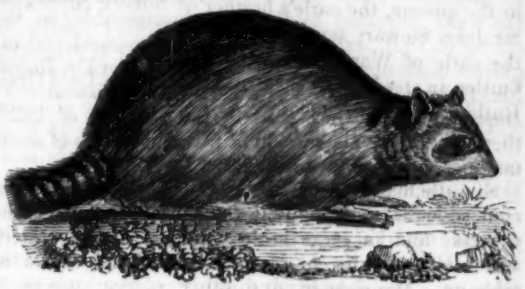
THE RACOON, (*Procyon lotor.*)

The Racoon is a well-known animal in the United States of America, where it is hunted by the inhabitants chiefly for the sake of its skin, which passes as a kind of currency in Kentucky, and other western districts of the vast continent of North America, a *coon* skin being valued at a quarter of a dollar.

At first sight a Racoon might be mistaken for a fox, but its body is much shorter and thicker; and when carefully examined, it is seen that it belongs to quite another tribe of animals; Linnæus placed it among the bears, and called it (*Ursus lotor*). Although the Racoon is so well known in the United States, it is not confined to that country, but is found in great numbers in the larger West India islands. In Jamaica particularly, the Racoons come down from the woods in great troops during the night, and commit great havoc among the sugar-canes; they are also extremely fond of maize, birds-eggs, and even young birds; the land-crab, also, is frequently the food of this animal. The negroes consider the flesh of the Racoon an excellent meal, but it is not much relished by Europeans. The fur is very valuable, being considered next to that of the beaver in the manufacture of hats.

In Kentucky, the hunting of the *coon* forms one of the principal sports of the hardy inhabitants. Audubon, in his usual spirited manner, gives an entertaining account of his nights' adventures during a Racoon hunt. His host is about to start, and makes preparation for the hunt, this is during the night:—

Now mark him, the bold Kentuckian is on his feet, his sons and the stranger prepare to march. Horns and rifles are in requisition, the good man opens the wooden-hinged door, and sends forth a blast loud enough to scare a wolf. The Racoons scamper away from the corn-fields, break through the fences, and hie to the woods. The hunter has taken an axe from the wood pile, and returning, assures us that the night is clear, and that we shall have rare sport. He blows through his rifle to ascertain that it is clear, examines his flint, and thrusts a feather into the touch-hole. To a leathern bag, slung at his side, is attached a powder-horn; his sheathed knife is there also; below hangs a narrow slip of home-spun linen. He takes from his bag a bullet, pulls with his teeth the wooden stopper from his powder-horn, lays the ball on one hand, and with the other pours the powder upon it, until it is just overtopped. Raising the horn to his mouth he again closes it with the stopper, and restores it to its place. He introduces the powder into the tube, springs the box of his gun, greases the *patch* over with some melted tallow, or damps it, then places it on the honeycombed muzzle of his piece. The bullet is placed on the patch over the bore, and pressed with the handle of the knife which now trims the edges of the linen. The elastic hickory rod, held with both hands, smoothly pushes the ball to its bed; once, twice, thrice, it has rebounded. The rifle leaps, as it were, into the hunter's arms, the feather is drawn from the touch-hole, the powder fills the pan which is closed,—'Now, I am ready cries the huntsman.



THE RACOON.

The whole party now start for the woods, with dogs, and boys, and torches, after a few delays, from the difficulties of the road.

The boys had got up with the dogs, which were baying a Racoon in a small puddle, we soon join them with the light,—'Now, stranger, watch and see.' The Racoon was all but swimming, and yet had hold of the bottom of the pool with his feet. The glare of the lighted torch was doubtless distressing to him; his coat was ruffled, and his rounded tail seemed thrice its ordinary size, his eyes shone like emeralds; with foaming jaws he watched the dogs, ready to seize each by the snout as it came within reach. They kept him busy for several minutes; the water became thick with mud; his coat hung dripping, and his draggled tail lay floating on the surface. His guttural growlings, in place of intimidating his assailants, excited them the more; and they very unceremoniously closed upon him, curs as they were, and without the breeding of gentle dogs! One seized him by the rump, and tugged, but was soon forced to let go; another stuck to his side; but soon, the racoon, taking a better-directed bite of his muzzle than another dog had of his tail, coon made him yelp; and pitiful were the cries of luckless Tyke. The Racoon would not let go, but in the mean time, the other dogs seized him fast, and worried him to death, yet to the last he held by his antagonist's snout. Knocked on the head by an axe, he lay gasping his last breath; and the heaving of his chest was painful to see. The hunters stood gazing at him in the pool, while all around was rendered trebly dark and dismal by the flare of the torch. It was a good scene for a skilful painter.

The dogs soon discovered another Racoon, who had taken refuge in a tree, round which they had ranged themselves, seated on their haunches, looking upwards and barking. The hunters now employed their axes to cut down the tree, sending the chips about in all directions.

At length the tree began to crack, and slowly leaning to one side, the heavy mass swung rustling through the air, and fell to the earth with a crash. It was not one coon that was surprised here, but three—ay, three of them, one of which, more crafty than the rest, leaped fairly from the main top while the tree was staggering. The other two stuck to the hollow of a branch, from which they were soon driven by one of the dogs. Tyke and Lion having nosed the cunning old one, scampered after him, not mouthing like the well-trained hounds of our southern fox-hunters, but yelling like furies. The hunter's sons attacked those on the tree, while the woodsman and I, preceded by Toby, made after the other; and busy enough we all were, our animal was of extraordinary size, and after some parley a rifle-ball was sent through his brain. He reeled once only—next moment he lay dead. The rest were dispatched by the axe and the club, for a shot, in those days, was too valuable to be spent when it could be saved. It could procure a deer, and was therefore worth more than a coon's skin.

We have seen that the Racoon displays considerable courage and fierceness when acting on the defensive, but it is not naturally a savage animal; it is easily tamed, and will follow its master about, and from its activity and monkey-like tricks becomes an amusing pet.

FILTRATION OF THAMES WATER.

THE managers of the Chelsea works having determined to prosecute some plan for rendering the quality of the water supplied by them unobjectionable, in the spring of 1826, experiments were commenced and inquiries made upon the subject, so that when Dr. Roget, Mr. Brande, and Mr. Telford, (the Commissioners of Inquiry,) visited the works in the summer of 1828, they found the construction of filtering-works of some magnitude in an advanced state.

So little had been written on the subject of filtration of a practical nature, that the art of conducting the process upon a large scale was yet to be acquired, and improvements to be made upon the works at Glasgow, Manchester, and other places, where it appeared that instances of failure, as well as of success, had occurred. Preliminary experiments were indispensable to warrant expenditure of capital on such works, and several trials were accordingly made on superficies exceeding one thousand square feet, to ascertain the most approved principle, and the fitness of the various materials proposed to be employed. All the modifications of lateral and ascending filters proved disadvantageous; difficulties were encountered in preserving the various strata in their assigned position, according to the sizes of their component particles; and effectual cleansing could not be accomplished without the removal of the whole mass of the filtering medium. All devices by currents, reaction of water, and other means, also proved either inefficient, or inconvenient and expensive.

The mode of filtration adopted at the Chelsea works is by descent, and the medium consists of fine and coarse river-sand, comminuted shells, and pebbles, and of small and large gravel. These materials are laid in a reservoir, their surface being disposed in ridges, which presents to the spectator an undulated appearance. The first experiments by descent failed; sufficient care had not been taken in the selection and separation of the materials. Explosions of condensed air in the tunnels for collecting the filtered water deranged the strata occasionally, and were obviated by air-drains. The filtration was, in one instance, stopped by the addition of fresh sand, without having previously removed the old sand, which should be applied as the upper stratum; although, in this case, the surface had been thoroughly cleansed previously, a film or puddle was formed on the original sand, and was sufficiently supported by the particles of sand to sustain five feet head of water, at first acting to impede, and eventually to stop the filtration. The process was greatly improved by the introduction of the small shells, such as are usually found at Shellness, the flat surfaces of which overlap, and assist in the great desideratum of separating the sand from the gravel, and thus tending to preserve the free percolation in the lower strata, which is essential for ensuring filtration sufficiently rapid for waterwork purposes.

The strata on the site of the filtering-works, under the vegetable mould, consist of loam, sand, and gravel, overlying the London clay to the depth of thirty feet. The sand and gravel contain powerful land-springs, and the masses of ferruginous conglomerate they pass through are so great, that the water is of an objectionable quality; therefore, in constructing the basin to receive the filtering materials, it was necessary to exclude all the land-water by clay and cement walling.

An excavation into the sand and gravel, of sufficient depth to admit of the water from the river flowing on to the filtering bed, would have involved too great an outlay; and this circumstance led to the construction of the basin, at a level which rendered pumping the water from the river unavoidable; but the consequent subsidence of the water, and the command of a constant flow to the filtering-bed, are advantages which result from the expedient of pumping; and the interest of the money saved has more than compensated for the annual expense. The filtering-bed covers an area of one acre, and there is an elevated reservoir of nearly the same size. The lower stratum of gravel contains the tunnels for collecting the filtered water. They are built with cement-blocks, and partially open jointed, two spaces of an inch and a half on the bed, and the heading-joint of each brick being open. The fine gravel, pebbles and shells, and the coarse and fine sand, are laid upon the large gravel.

The water is let on to the filtering bed at nine places, and the ends of the pipes are fitted with curved boards to diffuse the currents of water, and prevent the surface of the sand from being disturbed. The interstices in the fine sand being more minute than the subjacent strata, it is found that the impurities are arrested near the surface, and it has not been necessary to remove more than one inch depth of the sand at any one time of cleansing. This work is effected by scraping the surface every fortnight, and upon a careful examination it has been discovered that the sediment penetrates to the depth of from six to nine inches, according to the state of the Thames water; the greatest penetration occurring during the prevalence of land floods in the river. Notwithstanding this, however, it is not necessary to remove more than the depth stated, which contains the grosser impurities, the remainder tending rather to improve filtration by rendering the interstices between the particles of sand still more minute. From these observations it must not be inferred that the process is merely a fine mode of straining, for something more is evidently effected; an appearance resembling fermentation being discernible when the water is in contact with the sand.

The quantity of water filtered is from three to four hundred thousand cubic feet daily, according to the demand. The undulated surface of the filtering-bed admits of parts of it being worked, and others drained; and it aids in cleansing, by admitting the grosser particles of the silt to slide down the ridges, and form a sediment easily manageable. The removal of the sand is effected by lifting portions of the fine sand in succession, and placing fresh sand of the same description underneath them.

There is every reason to anticipate the various works in course of execution by the London water companies will add greatly to the health, comfort, and convenience of the public, and as these works must of necessity be carried on by means of large capitals vested in fixed machinery, pipes, &c., for supplying an article consumable only on the spot, and as such machinery, pipes, &c., are of little or no value for any other purpose, they should not be interfered with upon slight grounds, or the representations of designing persons. It ought to be borne in mind that the deprivation of the accustomed supply of water in any particular district of the metropolis would be a calamity from which most serious injury to the public might ensue, more especially if it occurred in the summer, or during the prevalence of epidemic fever; and although the present supply of water in the metropolis is susceptible of improvement, it is superior to that enjoyed by any other city in Europe; and in any event, the preservation of that supply is a most important object.

[From a Paper by Mr. James Simpson, Resident Engineer at the Chelsea Water-works, in the *Life of Telford*.]

RECREATIONS IN NATURAL PHILOSOPHY.

No. III.

On Cohesion and Adhesion.

Why is it that two pieces of wood will not adhere or stick together, when we place their surfaces in contact; and that they will adhere when a surface or thin film of glue is between them? Why is it that two dry pieces of paper will not stick together unless paste or gum be interposed? The reader will reply, "because glue, paste, and gum, are *sticky* substances." But this term "sticky" gives us but little information concerning the cause and nature of the process; it will be worth while, therefore, to pay a little attention to this subject.

All bodies, whether solids, or liquids, or invisible gases, are formed of atoms, or very small particles, which are drawn or held together by a sort of attraction, the nature of which we are but little acquainted with. We know that the surfaces of our ponds become covered with ice in the Winter, and that the ice is formed from the water,—that it is, in fact, nothing more or less than solid water. Now, the whole reason why the water exhibits the solid form in one case, and not in the other, is, because the atoms of which it is composed are permitted to approach one another in such positions as to cohere or hold strongly together; and the reason why the particles or atoms are enabled thus to act upon each other, is, that a portion of heat which previously existed between the atoms has been removed by the cold weather. In the fluid state, heat acts as an obstacle, which prevents the atoms from acting on one another with that energy which they would do if the heat were not present.

In the condition of a liquid, the particles of a body have almost lost all their attraction for each other, for we may divide a tea-cup full of water into a thousand separate parts, with ease; but to divide the same bulk of ice into a thousand pieces, we must use mechanical force; the particles of which it consists, cohere or stick together so strongly, that some force is necessary to part them.

If we hold a piece of iron wire between the two hands, and try to pull it asunder, we fail in so doing: why is this? there is no glue, or cement, or paste, between the particles of iron? It is true that there is not one of these; but there is that which is more powerful, namely, a strong coherent attraction between particle and particle, by virtue of which each one refuses to part from those by which it is surrounded, unless a force is employed superior to that which binds the particles together.

It may be asked,—If this is the case, why do not two pieces of wood stick together, when we place their smooth surfaces in contact? The answer is, that the coherent attraction is exerted only at very small distances, and that as soon as those distances are exceeded, the particles are deprived of the power of acting upon one another. What the size of the particles is, or what are the distances between them, are questions totally out of our power to answer. Science has done much in measuring the minute and the great in nature, but it has failed in measuring the size of the atoms of matter. It is very certain that when we place two smooth surfaces of wood together, so as to make them appear in actual contact, the distance between them is far greater than that between the particles which compose the wood; that such is the case may be partially proved in the following manner. If we take two pieces of lead, cut from the same piece, so as to have two clean, freshly-cut surfaces, and if we apply those two surfaces together, they will not adhere; but if we rub them against each other for a short time, they will adhere together, and will require much force to separate them. The reason of this is, that in the first instance, the two surfaces, although apparently in contact, were too far asunder to permit the particles of the one to act upon those of the other; but, by rubbing them together, the surfaces become smoother, so as to allow them to approach closer together.

We must now make a difference between cohesion and adhesion. We shall apply the term cohesion to the attraction between the particles of the same body; and adhesion, to that manifested between different bodies.

We said, that in water, the power by which the particles cling together is exceedingly small; but there are many instances which show that it is not entirely absent. All schoolboys are acquainted with the game of "duck and drake:" a piece of slate, or a flat oyster-shell, is hurled obliquely on the surface of a pond, where, instead of sinking in the water, it rebounds and proceeds forward, then rebounds again, and so on, taking, perhaps, seven or eight long leaps over the surface of the pond before it finally sinks beneath the surface; the greater the number of leaps, the greater is the skill of the performer considered to be. This it would not do, if there were not some cohesive force between the particles of water which enable them to resist the entrance of the object between them, until its velocity is almost spent. The experiment proves two things, namely, that water has a slight cohesion and a slight elasticity: if it had not the latter, the slate or shell would not rebound from its surface.

We all know that we cannot heap water up in a measure, as we can coals or corn, because it flows over when we have filled it up to the brim. But if we notice when the water in a cup reaches the edge, we shall find that we can still pour a little more into it, provided we do it with care, and not wet the edge of the cup. Suppose that the adjoining figure, fig. 1, represents the cup in two different stages of its fulness. In the one case, where the cup is only partially filled, the surface of the water is nearly flat; it is, however, a little raised at the edges on account of a slight attraction between the cup and the water. But in the other instance, we see that the water is considerably above the dotted line, which represents the level of the edges of the cup: the surface of the water is convex.

Fig. 1.

Now this arises from a slight cohesive attraction between the particles of water. It is so slight that the water soon begins to flow over when the level of the edge has been attained and exceeded, but still the cohering or sticking together of the particles is sufficient to enable a small mound of water to remain above the level of the vessel so long as the edge remains dry.

Daily experience tells us that iron and steel are heavier than water: if we place an iron nail or a steel ring or key on the surface of water, they will not remain there, but will sink. The reason is, that they are, bulk for bulk, heavier than water, and therefore obey the general law of the heaviest going to the bottom. But there is a mode in which this law may be prevented from acting, by bringing the cohesion of water into play. It is the following.

If we take one or two slender-sewing needles, and place them very gently on the surface of water, as in the following figure, (fig. 2,) they will swim or float on the surface, although they are made of steel of as

heavy a quality as keys, or rings, or any other articles. The reason is that the cohesion of the particles of the upper layer of water, is sufficient to resist the entrance of the needle between them, as the needle is very small and light. The needle must not be wetted, or it will sink: when the experiment succeeds the needle lies in a little trough which it hollows for itself in a watery couch.

Fig. 2.

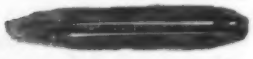


Fig. 3.

Many insects can perform a feat which no other animal, man not excepted, could accomplish without the aid of water-shoes, and much instruction, that is, they can walk on the surface of water. It is a pleasant sight to witness the sportive movements of a species of aquatic water-bug, and many other insects, whose slender feet move with agility on the surface of the water without sinking, simply because they have not the force to overcome the cohesive attraction of the watery particles. Fig. 3 represents an insect on the surface of the water. Some insects have their feet fringed, and the lower part of their bodies covered, with exceedingly fine hairs which buoy them up, and sometimes collect a globule of air under them which makes them still more buoyant, others use their wings by way of sails. Some of these aquatic insects have their bodies so highly polished that the water will not adhere to them.

These are examples of cohesion in a fluid. We shall have some proof of a similar power in solids, by taking two pieces of plate-glass and laying one on the other: they will cohere so strongly that it will require much more than the weight of the upper plate to lift it from the lower. This is because plate-glass is so very flat and smooth, that the particles of one surface are enabled to act upon those of the other. Very few manufactured articles are so flat and so smooth as plate-glass.

Particles of glue have the property, when softened or liquified, of adhering strongly to wood; and those of paste of adhering strongly to paper. When, therefore, we rub a thin coating of glue on a surface of wood, and upon that place another surface of wood, we have two examples of adhesion and one of cohesion: the lower surface adheres to the glue,—the upper surface does so likewise,—and the different particles of glue cohere or cling together,—so that all three form one body. It is, therefore, not strictly true to say that we make two pieces of wood stick together; we make the glue stick to the lower piece, and the upper piece sticks to the glue; but the two pieces of wood do not touch each other. The same observations which we have here employed with respect to two pieces of wood with glue between them, also apply to two pieces of paper with paste between them.

If we put a penny piece on a wet table, we cannot take it up again so easily as if the table were dry. The thin film of water adheres slightly to the table, the piece of copper adheres slightly to the water, and the particles of water slightly cohere among themselves; all these tend to make the penny piece rather more difficult to lift from the table; but as they are all small in amount, the difficulty is soon overcome.

If we wet the two plates of glass, of which we lately spoke, before we lay one on the other, we shall find that they cling together with much more force than before: the water acting as a species of glue.

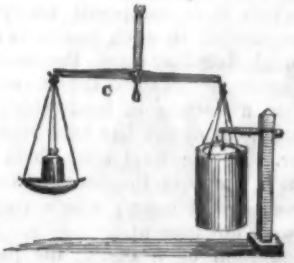
The formation of a globular drop of water is an instance of cohesion. Water never falls to the earth particle by particle; but the particles cling together until their collective mass is too heavy to remain longer suspended, upon which they fall in the form of drops.

The production of friction, which is so often an obstacle, and so often an advantage, in our machines, is greatly dependant on the adhesion of the surfaces of the rubbing bodies. The smoother the surfaces are, the easier do the bodies move on each other; but no degree of smoothness will do away with friction altogether; some will always be due to the adhering attractions of the two surfaces.

When we break a tea-cup, or a glass goblet, we may put the pieces together again, and they may fit so well that we can scarcely see the joint; but they will not hold: the attraction of cohesion has been broken, and we cannot put the edges so close together as they were before: a film of air will remain between them, and will prevent the cohesive force from acting.

The adhesion of solids to liquids is very great, and its amount may be ascertained by a contrivance represented in fig. 4. To the arm of a balance C, suspend a scale-pan at one end and a vessel of water

Fig. 4.



from the other end; place weights in the scale-pan until equilibrium is established. Let us now suspend a disk of copper, wood, or marble, or any solid substance from its centre, and firmly attached to a wooden upright, which is also fixed. The disk should be of the same height as the level of the water, which must be brought under the disk, as represented in the figure. The surface of water will adhere to the under surface of the disk with considerable force, so much so, that we may greatly diminish the weights in the scale-pan, and the cylinder of water will not fall down. A number of metal disks of the same size and thickness were thus applied to the surface of mercury, and it was found that weights could be taken out of the scale-pan as follows:—

Disk of Gold	446	grains
—— Silver	429	"
—— Tin	418	"
—— Lead	397	"
—— Bismuth	372	"
—— Platinum	282	"
—— Zinc	204	"
—— Copper	142	"
—— Antimony	126	"
—— Iron	115	"
—— Cobalt	8	"

It thus appears that among the metals the attraction of adhesion is greatest between gold and mercury, and least between cobalt and mercury.

When a man chooses the rewards of virtue, he should remember, that to resign the pleasures of vice is part of his bargain.——Wilberforce.

LONDON:
JOHN WILLIAM PARKER, WEST STRAND.
Published in Weekly Numbers, price One Penny, and in Monthly Parts price Sixpence.
Sold by all Booksellers and Newsvenders in the Kingdom.